

CONFIDENTIAL

20 December 1955

MEMORANDUM FOR: THE RECORD

SUBJECT : Visit to USNUSL

1. Time and Place of Meeting: 6 - 9 December 1955, Fort Trumbull,
New London, Connecticut

2. Attendance: Mr. Marshall Milligan USNUSL
Mr. Harold Bishop USNUSL
Mr. Joe Plesik USNUSL
[Redacted Box] Commo
APD

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3. Discussion:

a. Test procedures were worked out for the IR Commo gear (IS-1) which were taken to USNUSL for this purpose. The procedures were not ideal for the equipment but were based on what would probably be encountered in actual operation. It was decided to have one station on an island approximately six miles from the "Old Fort." Tests were conducted in the afternoons (1530) for approximately 1½ hours. Initial contact was established in about 25 minutes indicating extreme range under the existing conditions. This was borne out by reception. The island end received 100% whereas the fort end received only 80%. Night tests began at 1900 and after four hours of attempting to establish contact, were abandoned. The island received about 70% while the fort could only distinguish muffled chatter with no intelligence being transferred. Compatibility tests were run the following evening with two types of navy IR gear which are under development at USNUSL. Both types have a broader beam than our IS-1 and both use thallous sulphide detectors. At least one of the types uses a cesium vapor source light which lends itself to the response curve of the detector. One limitation of this type of system is that it cannot be used for daytime operation as the thallous sulphide detectors are effectively blocked out by the background radiation. This type detector is more sensitive than the PbS detector used in the IS-1 and was considered as a possible detector for it but was rejected for the reason mentioned above. The compatibility tests were conducted on the island over land. Transmissivity was 75% at the time of testing.

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DOCUMENT NO. 85
NO CHANGE IN CLASS. ☐
☐ DECLASSIFIED
CLASS. CHANGED TO: TS S 2010
NEXT REVIEW DATE: _____
AUTH: HR 70-2
DATE: 2/2/80 REVIEWER: 010956

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b. In the absence of [redacted], his assistant showed [redacted] their test for [redacted]. The transceivers used were standard submarine emergency gear which incorporate an 8KC carrier and a pass band of 850 - 3000 cps audio. The lower side band is filtered out. Power output of the transmitter section is one watt. The transducers were peaked at 27KC so some improvement would be expected by matching. A drawing of the pipe layout is attached. Tests were conducted to all open points (numbered). The maximum range tested was 47 feet. Poorest reception was at point #3 which was 30' 6" from the projecting transducer. All reception was usable; however, no feminine voices were used in the test. As expected, squeal was quite noticeable at this frequency. A formal report on the findings of this test will be forthcoming from USNUSL.

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c. Progress on the underwater telephone is slow. Batteries appear to be the problem as most batteries give off hydrogen in storage. All points that are possible sources of sparks or arcs are being shielded. A purging of the system will be made possible by the addition of two vents.

4. Conclusions:

a. The over water range of the IR commo gear is lower than that achieved between mountain peaks probably due to convection currents. Operating techniques will vary the maximum attainable range under a given set of conditions. Alignment can be assisted by using the compass and charts.

b. The [redacted] experiment proves that at 8KC, water transmission is feasible under certain conditions. It is probable that standing waves caused point #3 to be less sensitive than other points which would mean that each installation, of necessity, would be hand tailored to the job. Power would be required on both ends.

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c. The underwater telephone should be completed within 60 days.

[redacted]
TSS/APD

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Distribution:

- 1 - P-123
- 1 - P-101B
- 1 - Underwater Telephone
- 1 - RTW
- 1 - Chono

RTW/lj

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